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ACUTE RHEUMATIC OPTIC NEURITIS.—AC-  
COMMODATION IN THE AMAUROTIC EYE.

BY

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Presented by the author.





## ACUTE RHEUMATIC OPTIC NEURITIS.—ACCOMMODATION IN THE AMAUROTIC EYE.<sup>1</sup>

By C. ZIMMERMANN, M.D., Milwaukee, Wis.

**A**LTHOUGH there are quite a number of cases of ocular palsies, in which the rheumatic nature, at first assumed, proved to be erroneous, as their further course showed them to be precursors of a serious affection of the nervous system, *e. g.*, tabes, disseminated sclerosis, or syphilis of the brain, there is no doubt that a rheumatic paralysis of ocular nerves may occur.

In regard to the *optic nerve* it has been different. Michel (*Fahresbericht*, 17, p. 381), *e. g.*, asserts that he never saw a rheumatic neuritis, and thinks that such a diagnosis would be due to a lack of knowledge as to the causes necessary for the production of optic neuritis. Leber (*Graefe-Saemisch*, v., p. 814), however, admits the possibility of its rheumatic nature, and others (Samelsohn, Hock, Haendel, Perlia, Landesberg, and others) published cases of acute optic neuritis, which, in their opinion, were due to colds. Recently Deutschmann (*Beiträge zur Augenheilkunde*, Band i., pp. 21 and 428) described seven such cases, from which he formed the following clinical picture: Sudden amblyopia of one eye (only in one case of both), or sector-like defects of the visual field, even amaurosis, with ophthalmoscopic changes of fundus, owing to inflammation of the optic nerve and its sheaths, in which no other cause than "taking cold" could be ascertained, yielding to treatment with anti-rheumatics. Almost without exception the movements of the

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eye and pressing the eyeball into the orbit were painful. One case was complicated with paralysis of the abducens, two with mydriasis of the diseased eyes. In regard to the function the prognosis was favorable. After the disease ran its course, the ophthalmoscope revealed partial or total white atrophy of the disc.

I observed the following case, in which paralysis of left abducens was followed half a year later by an acute neuritis of the right optic nerve, both affections apparently due to rheumatic influences:

F. L., tanner, æt. thirty-three, came to me October 15, 1894, on account of diplopia, which he at first noticed six weeks previously. It came on suddenly with headache. After staying in bed for a few days he felt better, but now his headache is worse, and is chiefly perceived in left temple. It generally commences at 4 A.M. Gonorrhœa about ten years ago; lues denied. But the patient is very much exposed to wet and cold. His work consists in pulling hides out of cold fluid in a room in which six steam-pipes run two feet above his head, so that he perspires, and his feet get wet and cold. The diplopia was due to paralysis of left abducens. *Ophthalmoscopically*: no changes, except *conus*. Myopia. V with  $-2.00$  D =  $\frac{1}{10}$ . Headache, and paralysis of abducens healed after administration of iodide of potassium.

May 19, 1895 he came again on account of his *right eye*, with the following history: May 10th, after a sudden fall of temperature, his headache recommenced in right side of head. He noticed that the electric lights appeared green to his right eye and, while working, it seemed to him as if somebody stood at his right side, and was moving to his left. Finally, the sight of his right eye failed completely.

The right palpebral fissure is smaller than the left. The *right pupil* is smaller than the left, does not react to light directly, but consensually; the left reacts directly, but not consensually. Both pupils react on convergence and accommodation.

V R only motion of hand in a small area of upper nasal portion of V. F. *Ophth.*: *Papillitis*, swelling of optic disc = 3 D (= 1 mm), with œdema, veins tortuous and linked.

V L with  $-2.00$  D =  $\frac{1}{10}$ . V. F. not contracted. *Ophth.*: *Conus*.

He localizes the *pain* mostly in the right side of his head, above

the right eyeball, and in the depth of the orbit. The *scalp* is not tender to the touch. *Urine* free from albumen and sugar. No other disease, especially no signs of *lues*. Sublimate pills were ordered. *May 22d*, still severe headache. Inunctions of ugt. hydr. cin. *May 27th*.  $V = 0$ . Considerable pain in right temple towards ear. Put to bed. Diaphoresis with natr. salicyl. *May 30th*. Headache still unabated. Four leeches on right temple. *June 2d*. The leeches relieved his headache a little. Movements and pressure on eyeball not painful. He feels as if the eye were pushed out. Iodide of potassium was given, after which, on *June 7th*, the pain in head and temple had subsided. *Ophth.*: Papillitis still at its height. *June 14th*. At upper nasal periphery of right optic disc, two small hemorrhages in the course of a vessel. Swelling of disc only = 2.00 D ( $= \frac{2}{3}$  mm) *June 23d*. He works again, feels very well, no further pain.  $V = 0$ . Atrophy commences. *July 7th*. Papillitic white atrophy of right optic nerve is established, outlines still hazy, but no more swelling of disc. Iodide of potassium continued. *October 12th*. White atrophy of right optic disc.  $V R = 0$ . L eye and pupils as before. The patient is extremely sensitive to changes of weather and to cold. Two weeks ago, when it was very windy, he was again seized with pain in right side of head for five or six days.

Our case is in some points in accordance with the symptoms described as characteristic, in some however it differs. (1.) The onset was sudden. (2.) The affection was limited to one eye. (3.) There was previous exposure to cold. (4.) *Ophth.*: typical papillitis, ending (5), with total white atrophy. (6.) Rheumatic paralysis of left abducens had preceded. (7.) The primary disease healed after the administration of iodide of potassium, as we may infer from the alleviation of headache.

It differed in the following points: (1.) There was severe pain in head, temple, and depth of orbit, but not on movements of the eye nor on pressing the eyeball into the orbit. (2.) The pupil of the affected eye was myotic (not larger than the others, as in two of Deutschmann's cases). It acted only consensually, precluding the consensual reaction of the other pupil. (3.) The prognosis in regard to function was

not favorable, as V was not recovered in spite of the use of mercury, salicylates, and iodides.

Although there was no reason to doubt the patient's statement that he never had lues, nor for the assumption of lues insontium, as there were no signs of it, it may be mentioned that syphilitic papillitis and optic neuritis without complicating intracranial affections are very rare, and, if they should occur, they are usually bilateral (Uhthoff. *v. Graefe's Archiv*, 39, 3, pp. 149, 155). The unilateral amaurosis indicates that the affection was limited to the orbital portion of the right optic nerve, not encroaching upon the chiasm. Under this condition the severe pain in right side of head, in right temple, and depth of orbit suggest a process at the *optic foramen*, most likely a *periostitis*, as pointed out by Leber (*Graefe-Saemisch*, v., p. 815). From here a descending inflammation of the dural sheath, which is a continuation of the periosteum, and the pial septa of the optic nerve, *i. e.*, a perineuritis with optic neuritis, was propagated down to the disc. The swelling in the narrow bone canal caused such a constriction of the optic nerve that, when the patient was first seen, not only the visual fibres, but even the more resistant pupillary fibres were destroyed. Therefore a restoration of their function could not be effected, although the original cause, the periostitis itself, disappeared.

A contraction and reflex insensibility (not reflex immobility) to light of the pupil of the diseased eye, as in our case, has not been observed in those published heretofore. Deutschmann thinks that the mydriasis in two of his cases may perhaps be attributed to a slight affection of the ciliary ganglion, which lies closely near the optic nerve. This could not exist in our case, as the centrifugal pupillary nerves, coming from the ciliary ganglion, were intact,—the pupil reacted consensually and on accommodation and convergence. Cutting of the optic nerve, as done by Schiess-Gemuseus in a case of myxo-sarcoma of the optic nerve, and by Wagenmann in his experiments on rabbits, produced large dilatation of the pupil (*v. Graefe's Arch.*, 34, 3, p. 228, and 36, 4, p. 64.) Constriction of the optic nerve

by periostitic swelling probably has the same effect as cutting, so that we would rather expect mydriasis than myosis. Deutschmann (*v. Graefe's Arch.*, 28, 2, p. 293), however, observed in his experiments on sympathetic ophthalmia in rabbits extreme contraction of pupil, when he injected a  $\frac{3}{4}$  per cent. solution of chloride of sodium, containing spores of aspergillus, into the optic nerve with Pravaz's syringe. A slight myosis remained for the next few days. This might have been due to an irritation of the centripetal pupillary fibres of the optic nerve. The same reason for contraction of the pupil may have been furnished in our case by an accumulation of inflammatory products within the optic sheaths. From clinical experience we know that reflex insensibility of the pupil is generally associated with myosis and not with mydriasis (Michel, *Lehrbuch d. Aug.*, p. 339).

Our case shows that the prognosis of rheumatic optic neuritis is not as favorable in regard to the function as Deutschmann asserts. It depends entirely in which stage the affection comes under treatment. If it is as far advanced as in our case, in which a destruction of the optic-nerve fibres had taken place by the intense process, recovery of function will be impossible.

#### ACCOMMODATION IN THE AMAUROTIC EYE.

Aside from its pathological interest, our case answered all requirements for deciding a physiological question, viz.: in regard to the equal impulse of accommodation in both eyes. Hess, Greeff, and others proved that in anisometropia the accommodation in both eyes is equal under all circumstances, and refuted the opposite opinions for some time in vogue. Greeff (*Klin. Mon. für Aug.*, 1895, p. 322) found the same in a blind eye, the fellow of which had good vision. For such tests eyes can only be used in which the accommodative apparatus is not diseased. In our case we had atrophy of one optic nerve, the eye itself, especially the ciliary nerves, being intact, with normal vision of the other eye. By means of sciascopy it could be ascertained that an

accommodation at a distance of 25 *cm*, *e.g.*, produced an additional myopia of 4.00 D in the amaurotic as well as in the healthy eye. I could make the same observation in a similar case. This shows that the impulse of accommodation is the same in both eyes, no matter whether or not there is any interest in binocular vision or in an equal muscular effort.







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